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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,681	09/19/2003	Demetri Psaltis	P397-US	4072

72932 7590 07/20/2011

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EXAMINER	
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ART UNIT	PAPER NUMBER
2627	

MAIL DATE	DELIVERY MODE
07/20/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/664,681	PSALTIS ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER LAMB	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,10,11,14 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,10,11,14 and 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-6, 14, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magnitski et al. (US 6,522,616) in view of Glushko et al. (US 6,291,132) and further in view of Bawendi et al. (US 6,774,361).

Regarding claim 1:

Magnitski discloses:

A method of storing data comprising:

distributing materials in a plurality of distinct data pit locations on a data storage medium (column 2, lines 50-65; column 3, line 58 to column 4, line 5),

the materials providing two or more different colors (column 3, line 58 to column 4, line 5),

wherein the plurality of distinct data pit locations different from each other for at least one of said two or more different colors and represent different states, each state being defined by two or more bits corresponding to the presence or absence of said two more different colors (column 4, lines 1-10; Fig. 5);

exciting said colors with said materials at each location by making them fluoresce (column 3, lines 35-45);

measuring said fluorescence of said materials at each distinct location to identify presence and absence of each of said two more different colors (column 3, lines 35 to 60),

wherein a number of said distinct data pit locations is related to a number of said two or more different colors (this follows from the disclosure that the data density is higher with more colors, as in column 3, line 58 to column 4, line 2).

Magnitski does not disclose:

(A) wherein the distinct data pit locations are "on a rotating data storage medium disk."

(B) wherein said materials are:

"a plurality of nanometer beads filled with nanometer sized particles,

"the nanometer sized particles providing two or more different colors to the nanometer beads."

Regarding (A):

Magnitski's data storage medium is a card, not a rotating disk.

Glushko discloses that it is possible to implement a fluorescent data storage medium as a card or rotating disk, among other possibilities (column 7, lines 25-35).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Magnitski wherein the data storage medium is a rotating data storage medium disk, as taught by Glushko.

The rationale is as follows:

Glushko and Magnitski are directed to the same field of art (i.e., optical recording using fluorescent materials).

Magnitski differs from the claimed invention because it discloses a card rather than a rotating disc.

Glushko teaches that a rotating disc is a known alternative to a card, and that the differences between the two are well known (e.g., column 8, lines 20-30).

Therefore one of ordinary skill could have substituted this known alternative form for the card taught by Magnitski, and the results of the substitution would have been predictable.

Regarding (B):

Bawendi discloses materials that are:

a plurality of nanometer beads filled with nanometer sized particles (column 14, lines 15-50),

the nanometer sized particles providing two or more different colors to the nanometer beads (column 6, lines 25-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Magnitski wherein the fluorescent materials are a plurality of nanometer beads filled with nanometer sized particles, the nanometer sized particles providing two or more different colors to the nanometer beads, as taught by Bawendi.

The rationale is as follows:

Magnitski and Bawendi (and Glushko) are directed to the same field of art (information storage using fluorescent materials).

Magnitski uses fluorescent dyes to record information (e.g., column 5, lines 40-50).

Bawendi specifically discusses using fluorescent dyes to store information (column 3, lines 5-15) and discloses that quantum dots are superior (column 3, lines 5-40).

One of ordinary skill could have combined this known improvement, quantum dots, with the disclosure of Magnitski, and the results would have been predictable.

Regarding claim 3:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein said nanometer sized particles are nanometer sized fluorescent particles (taught by Bawendi as discussed above).

Regarding claim 4:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein said nanometer sized particles comprise quantum dots (taught by Bawendi as discussed above).

Regarding claim 5:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein said quantum dots are made up of red, blue and green color (Magnitski's fluorescent materials are these colors, as per column 3, line 65 to column 4, line 5, so in the combination it follows to use quantum dots of these colors).

Regarding claim 6:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein said quantum dots are made up of a plurality of shades of a color (gray levels, as per Magnitski column 4, lines 1-10, are a plurality of shades of a color, and Magnitski discloses combining gray level and colors).

Regarding claim 14:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein the beads placed in the same data pit location are further colored with different shades of a color (gray levels, as per Magnitski column 4, lines 1-10, are a plurality of shades of a color, and Magnitski discloses combining gray level and colors).

Regarding claim 19:

Magnitski in view of Glushko, and further in view of Bawendi, discloses a method as discussed above.

Magnitski in view of Glushko, and further in view of Bawendi discloses wherein the two or more different colors are red, green and blue as discussed above.

Magnitski in view of Glushko, and further in view of Bawendi, does not explicitly disclose:

wherein red is the most significant bit followed by blue and green is the least.

Nonetheless this would have been obvious to one of ordinary skill in the art at the time of the invention.

The rationale is as follows:

Of the three, one has to be the most significant bit, one the middle, and one the least.

There's a finite number of identified, predictable potential solutions to this problem.

One of ordinary skill could easily have pursued the known potential solutions with a reasonable expectation of success.

Furthermore, it makes no difference to the operation of the apparatus which of the three is the most, middle, or least significant bit. One could substitute the particular bit order claimed by applicant with any other and it would operate no differently.

Regarding claim 20:

All elements positively recited have already been identified with respect to earlier rejections (for the "different shades," see claims 6, 14). No further elaboration is necessary.

Regarding claim 21:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein the number of said distinct data pit locations is N/M, where N is a number of bits to be stored and M is the number of said different colors (follows from Magnitski column 3, line 58 to column 4, line 2: the actual equation is not disclosed but is the trivial result of the increased density discussed).

Regarding claim 22:

Magnitski in view of Glushko, and further in view of Bawendi, discloses:

wherein the number of said distinct data pit locations is N/L^M, where N is a number of bits to be stored, M is the number of said different colors and L is a number of different shades of each different color (follows from Magnitski column 1, lines 1-10;

Magnitski doesn't explicitly show the equation but it follows form the discussion -- not that Magnitski gives a specific example where L is 20 and M is 5 and the result disclosed (about three bytes) is the result of the claimed equation).

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magnitski in view of Glushko, and further in view of Bawendi, as applied to claim 1 above, and further in view of Metz (US 5,166,813).

Regarding claim 10:

Magnitski in view of Glushko, and further in view of Bawendi, discloses a method for storing data as discussed above in the rejection of claim 1.

Magnitski in view of Glushko, and further in view of Bawendi, does not disclose "wherein a HSMF is used for dispersing collimated fluorescent light on a spectrally sensitive component."

Metz discloses that when detecting fluorescence, a holographic multi-spectral filter is used for dispersing collimated fluorescent light on a spectrally sensitive component (the abstract discloses the use of a holographic filter; Fig. 1 depicts the light impacting the spectrally sensitive component; column 12, lines 40-50 discloses that the hologram can be multi-spectral: that is, it transmits more than one wavelength). Metz discloses that a holographic filter is more efficient (column 13, lines 1-15).

It would have been obvious to one of ordinary skill at the time of the invention to include in Magnitski in view of Glushko, and further in view of Bawendi, a holographic multi-spectral filter as taught by Metz.

The combination would have been predictable to one of ordinary skill in the art; the motivation would have been to be more efficient.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magnitski in view of Glushko, and further in view of Bawendi, as applied to claim 1 above, and further in view of Wenzel et al. ("Shaping nanoparticles and their optical spectra with photons," Applied Physics B 69 513-517; disclosed in IDS).

Regarding claim 11:

Magnitski in view of Glushko, and further in view of Bawendi, discloses a method of storing data as discussed above.

Magnitski in view of Glushko, and further in view of Bawendi, does not disclose wherein:

"said plurality of nanometer beads are distributed in said plurality of distinct data pit locations using laser-induced technology at each of said plurality of data pit locations."

Wenzel discloses:

fabricating nanometer beads using laser-induced technology (e.g., "Conclusions," on page 516).

Therefore it would have been obvious to one of ordinary skill in the art to include in Magnitski in view of Glushko, and further in view of Bawendi, wherein said plurality of nanometer beads are distributed in said plurality of distinct data pit locations using laser-induced technology at each of said plurality of data pit locations.

The rationale is as follows:

Magnitski in view of Glushko, and further in view of Bawendi, relies upon placing nanometer beads in a plurality of distinct data pit locations.

Wenzel discloses a known method of fabricating said beads.

One of ordinary skill could have used this known method in Magnitski in view of Glushko, and further in view of Bawendi, and achieved predictable results.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magnitski in view of Glushko, and further in view of Bawendi, as applied to claim 1 above, and further in view of Fuller et al. ("Ink-Jet Printed Nanoparticle Microelectromechanical Systems," Journal of Microelectromechanical Systems, Vol. 11, No. 1, February 2002, disclosed in IDS).

Regarding claim 18:

Magnitski in view of Glushko, and further in view of Bawendi, discloses a method as discussed above.

Magnitski in view of Glushko, and further in view of Bawendi, does not disclose wherein:

said plurality of nanometer beads are distributed in said distinct data pit locations using inkjet technology at each of said plurality of data pit locations.

Fuller discloses:

wherein nanometer beads are placed using inkjet technology (page 54: last two paragraphs).

It would have been obvious to one of ordinary skill in the art to include in Magnitski in view of Glushko, and further in view of Bawendi, wherein said plurality of

nanometer beads are distributed in said distinct data pit locations using inkjet technology at each of said plurality of data pit locations.

The rationale is as follows:

Fuller demonstrates that inkjet technology is a known method for depositing nanometer beads. Fuller discloses that is advantageous (page 54).

One of ordinary skill could have combined the teaching of Fuller with that of Magnitski in view of Glushko, and further in view of Bawendi and achieved predictable results.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi.

Regarding claim 20:

Glushko discloses:

A method of storing data comprising:

distributing materials in a plurality of distinct data pit locations on a rotating data storage medium disk (column 12, lines 35-50),

the materials providing two or more different shades of a color (column 13, line 60 to column 14, line 15: different concentrations will be different shades),

wherein the plurality of distinct data pit locations differ from each other for at least one of said two or more different shades and represent different states (column 14, lines 5-15),

each state being defined by two or more bits corresponding to the presence or absence of anyone of said two more different shades (column 14, lines 5-15);

exciting the two or more different shades of said color within said materials by making them fluorescent (column 12, line 50 to column 13, line 5);

measuring said fluorescence of said materials at each distinct location to identify presence and absence of each of said two or more different shades (column 13, line 45-65),

wherein a number of said distinct data pit locations is related to a number of said two or more different shades ().

Glushko does not disclose:

wherein said materials are:

"a plurality of nanometer beads filled with nanometer sized particles,

"the nanometer sized particles providing two or more different shades of a color to the nanometer beads."

Bawendi discloses materials that are:

a plurality of nanometer beads filled with nanometer sized particles (column 14, lines 15-50),

the nanometer sized particles providing two or more different shades of a color to the nanometer beads (column 6, lines 25-65: different discrete emissions could be different colors or different shades of one color).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko wherein the fluorescent materials are a plurality of nanometer beads filled with nanometer sized particles, the nanometer sized particles providing two or more different colors to the nanometer beads, as taught by Bawendi.

The rationale is as follows:

Glushko and Bawendi are directed to the same field of art (information storage using fluorescent materials).

Glushko uses fluorescent dyes to record information.

Bawendi specifically discusses using fluorescent dyes to store information (column 3, lines 5-15) and discloses that quantum dots are superior (column 3, lines 5-40).

One of ordinary skill could have combined this known improvement, quantum dots, with the disclosure of Glushko, and the results would have been predictable.

Response to Arguments

7. Applicant's arguments filed June 15th, 2011 have been fully considered but they are not persuasive.

Applicant argues (section 2.2) that Magnitski fails to disclose that "the plurality of distinct data pit locations differ from each other for at least one of said two or more different colors and represent different states."

Applicant's argument is that in Magnitski, a single pit can have multiple colors or gray levels, and therefore Magnitski "focuses on information density of a single pit."

Magnitski discloses having more than one pit on the disc. If each pit has a combination of colors and gray levels, the pits differ from each other in color and shade, and therefore meet the claim language.

Applicant next argues (section 2.3) that the newly amended language of claim 1 wherein "a number of said distinct data pit locations is related to a number of said two more more different colors" is not disclosed in the references.

All this language says is that the density of the data pits depends on the number of colors: if there are more colors, the medium is higher density; if there are less colors, the medium is lower density.

This is clearly stated in Magnitski. Magnitski not only discloses that more colors increases the density, but also discloses a specific example and indicates the number of bytes per pit.

It is of course inherent that if a medium is higher density, it requires less data pit locations to store the same amount of data, which appears to be the intent of applicant's claim language.

Applicant's next arguments (2.4) are similar and similarly not persuasive.

Applicant next argues (section 3) that the dependent claims are allowable due to the supposed allowability of the independent claims. Since the arguments with respect to those claims were not found to be persuasive, this argument is not either.

Applicant next argues (section 4) that new claims 21-22 are allowable. This is similar to the earlier argument about the number of distinct data pit locations. Although the references do not explicitly show the claimed formulas, these formulas are just the data density given the number of colors and shades, and the result is inherent to the references. Furthermore, Magnitski gives a specific example that matches the result of the claimed formulas.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER LAMB whose telephone number is (571)272-5264. The examiner can normally be reached on 9:00 AM to 5:30 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher R Lamb/
Primary Examiner, Art Unit 2627